MINUTES

INSTALLATION RESTORATION PROGRAM

RESTORATION ADVISORY BOARD MEETING

ABERDEEN PROVING GROUND, MARYLAND

THURSDAY, 26 AUGUST 2004

7:00 p.m. – 9:45 p.m.

EDGEWOOD SENIOR CENTER

RESTORATION ADVISORY BOARD MEMBERS PRESENT AT THIS MEETING:

Mr. Kevin Barnaba
Mr. Arlen Crabb
Mr. Roy Dietz
Mr. Butch Dye (Maryland Department of the Environment)
Ms. Mandi Elliott-Bird)
Mr. Ted Henry
Mr. Ken Stachiw (Army Co-Chair)
Mr. Frank Vavra (U.S. Environmental Protection Agency)
Mr. Dennis Warwick
Ms. Ruth Ann Young

RESTORATION ADVISORY BOARD MEMBERS NOT PRESENT AT THIS MEETING:

Ms. Glenda Bowling
Ms. Christine Grochowski (Community Co-Chair)
Mr. Thomas G. McWilliams
Mr. Dan Pazdersky
Mr. Doug Richmond (Harford County Emergency Operations Center)

ENCLOSURES TO THESE MINUTES:

1: Roster of Meeting Attendees
2: Agenda
3: September 2004 Calendar of Events
4: City of Aberdeen Perchlorate Detections Maps
5: Westwood Study Area Presentation Materials

I. EXECUTIVE SUMMARY

Administrative Comments

Mr. Ken Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD)) informed RAB Members that the next Performanced-Based Contract (PBC) Subcommittee Meeting has been scheduled for 20 September 2004. Mr. Frank Vavra (Environmental Protection Agency (EPA)) introduced Ms. Melissa Pennington. Ms. Pennington will be assisting Mr. Vavra with the Installation Restoration Program (IRP) sites at APG. Mr. Arlen Crabb (RAB Member) reported that a boat tour for the RAB Members was conducted to view the shorelines of the Edgewood Area of APG. Several RAB Members who attended the tour expressed that the tour was informative and worthwhile.

Perchlorate Detections Update

Mr. Stachiw displayed slides depicting results from the latest rounds of perchlorate sampling. The perchlorate detections reported from the 3 August 2004 sampling event ranged from non detect in City of Aberdeen Production (CAP) Well 9 after filtering, to 0.99 J parts per billion (ppb) in CAP Well 11. A result of 0.22 J ppb was reported for the finished water. Concentrations reported from the 17 August 2004 sampling event ranged from non detect in CAP Well 9 after filtering, to 2 ppb in CAP Well 3. A result of 0.16 J ppb was reported for the finished water. Mr. Stachiw reported that no further information has become available with regard to Strategic Environmental Research and Development Program (SERDP) funding for soil cleanup.

Westwood Study Area Update

Ms. Jennifer Schaefer (General Physics Corporation) provided an update on the Westwood Study Area (WSA) Feasibility Study (FS) and Planned Actions/Schedule.

Feasibility Study Update

Ms. Schaefer stressed that no commitments or decisions have been made with respect to the FS remedial alternatives and cost estimates presented. The objectives of the recent field sampling efforts were to acquire data to support estimates of metals-contaminated soil volumes and calculation of FS remedial alternative costs at Operable Units (OU) A, B, and C. The field sampling efforts also acquired data to characterize the nature and extent of potential contamination at additional potential source areas within the WSA.

Hog Point Site - OUA. The surface soil samples contained arsenic at concentrations ranging from 5.4 parts per million (ppm) to 365 ppm. Other metals of concern were also detected in exceedance of maximum reference background levels. The subsurface soil direct push technology (DPT) sampling indicated that arsenic was leaching into the groundwater due to the nature of soils at the site.

Ms. Schaefer presented three different proposed soil remedial areas based on proposed arsenic remedial goals of 38 ppm, 57 ppm, and 85 ppm. The 85-ppm cleanup level was based on human health risk with a hazard quotient of 1 for construction workers. The 57-ppm cleanup level was established based on modeling of the predicted concentration of arsenic that is leaching from soil to groundwater. The 57-ppm concentration in soil will prevent the arsenic level from exceeding the maximum contaminant level (MCL) in the groundwater when averaged across the aquifer. The 38-ppm cleanup level would be protective of soil invertebrates. The 38-ppm level is also based on human health risk of 10^{-4} for hypothetical residential use.

The estimated remedial volumes (in-place) were presented as 265 cubic yards (cy) for Area A; 1,757 cy for an arsenic cleanup level of 85 ppm; 3,680 cy for an arsenic cleanup level of 57 ppm; and 9,333 cy for an arsenic cleanup level of 38 ppm. The proposed remedial alternatives and associated costs for the Hog Point Site include no action ($110,000), excavation of contaminated soil to arsenic remedial goal of 85 ppm ($1,302,000), excavation of contaminated soil to arsenic remedial goal of 57 ppm ($1,996,000), excavation of contaminated soil to arsenic remedial goal of 38 ppm ($4,115,000), and consolidation and capping of contaminated soil to arsenic remedial goal of 38 ppm ($3,066,000).

Gas Mask Factory - OUB. Test dig efforts completed in support of the FS indicated an average thickness of waste material ranging from 1 to 6 feet. Surface soil and sediment sampling results indicated the highest concentration of PAH and metals are located within the visible waste areas of the dump sites. Any additional area of elevated lead concentrations in surface soil was identified within a drainage pathway north of Dump Site B. Subsurface soil sampling results indicated that leaching of metals to subsurface soils beneath waste material within the dump sites is not occurring.

Lead is the driver for the extent of remedial areas within OUB. The proposed remedial goal for lead is 421 ppm. The remediation goal is based on the proposed human health remedial goal for construction and outdoor workers (425 and 449 ppm), and the ecological remedial goal for soil invertebrates (411 ppm).

The estimated volume (in-place) for soil/waste cleanup is 1,428 cy. The proposed remedial alternatives and associated costs for the Gas Mask Factory site include no action ($110,000), excavation of waste and contaminated soil ($626,000), and excavation of waste and contaminated soil without inclusion of drainage area ($567,000).

Brine Sludge Disposal Area - OUC. Test dig efforts within the brine sludge disposal area indicated that only the top 1 to 2 feet of waste within the site is strictly brine sludges. An additional 15 inches of burn residue and metal remnants remains beneath the brine layer. Media sampling results indicated a migration of contaminants from surface soils to downgradient sediment points. Several metals were detected above the maximum background reference levels in surface soil samples. Metals, with the exception of copper and arsenic, were also detected in subsurface soil samples, but at levels below the background levels.

The estimated volume for soil/waste cleanup is 192 cy. The proposed remedial alternatives and associated costs for the Brine Sludge Disposal Area include no action ($110,000), and excavation of waste and contaminated soil ($138,000).

WW-90 Fill Area and Drum Dump. The test dig efforts completed in the Fill Area indicated a topsoil layer over the fill ranging from approximately 9 to 13 inches deep. Some areas of subsidence were noted. Waste material was identified within the surficial aquifer. The area of contaminated soil was estimated to be 1.1 acres, and based on seismic refraction data, the average depth of waste was found to be 14 to 16 feet. The estimated remedial volume (in-place) for soil/waste cleanup is 28,169 cy. The proposed remedial alternatives and associated cost estimates for the WW-90 Fill Area include no action ($110,000), and soil cover and long-term monitoring ($1,948,000).

The test dig efforts completed in the Drum Dump area concluded that subsurface anomalies were too extensive and difficult to recover by hand. Several compounds, such as DDTr, copper, lead, and zinc, were detected at levels exceeding maximum background reference values. The estimated volume (in-place) for soil/waste cleanup is 676 cy. The proposed remedial alternatives and associated cost estimates

for the WW-90 Drum Dump area include no action ($110,000), and excavation of waste and contaminated soil ($220,000).

HC Grenade Disposal Site. The test dig effort indicted an area of waste material that was much larger than anticipated. The estimated area of contaminated soil and waste remaining on site is approximately 270 square feet. The proposed remedial volume (in-place) for cleanup is 40 cy. The proposed remedial alternatives and associated cost estimates include no action ($110,000), and excavation of waste and contaminated soil ($129,000).

Westwood Radioactive Material Disposal Facility (WRMDF). The test dig effort in the central and eastern portion of the site indicated linear anomalies associated with corrugated drainage pipes and a buried electric utility line. A third linear anomaly at the south end of the site corresponded to a 2-inch diameter water line. The test dig effort within the western disposal area indicated waste comprised of a mix of household and military-related materials. The area of buried waste was found to be approximately 8,400 square feet. The estimated volume (in-place) for soil/waste cleanup is 622 cy. The proposed remedial alternatives and associated cost estimates for the Western Disposal Area include no action ($110,000), and excavation of waste and contaminated soil ($202,000). Additional sampling is proposed to confirm the Cesium-137 (Cs-137) detection and define the extent of contamination in the former Headwall Area. If required, the contamination will be excavated.

Cluster 2. Based on a previous silver detection in soil, six surface soil samples were taken to confirm the presence and extent of silver in the surface soil at Cluster 2. No detections of silver were found in any of the surface soil samples. At the Cluster 2 Paint Can Dump #2 one test dig was completed to provide anomaly verification and identify any observed metallic waste. All waste and soil containing visible paint fragments were removed from the site. One surface soil sample was collected to determine the presence of potential contaminants remaining in soil after the removal of waste material. No active remediation is proposed for the Cluster 2 Silver Detection and Paint Can Dump # 2.

Roads End Disposal Site. Seven test digs were conducted to provide anomaly verification and to identify and observe waste. One subsurface soil sample was taken from each of two test dig locations to define the nature of potential contamination. The test dig effort recovered mostly hot rock and individual metallic objects. The constituents detected during sampling were at levels below proposed human health and ecological remedial goals. No active remediation is proposed for the Roads End Disposal Site.

Western WSA Potential Source Areas. A total of 29 test digs were completed within 29 potential waste disposal sites to provide anomaly verification and to identify any observed waste. A subsurface soil sample was also collected from each test dig location to define vertical extent and nature of potential contamination. Metallic material was removed from all but one of the mounds and anomalies during the test dig effort. The remaining mound measures 20 feet long by 6 feet wide by 3 feet deep. A soil sample collected from the mound contained lead at levels exceeding screening criteria and the proposed remediation goals. No active remediation is proposed for 28 mounds. Remediation of the remaining mound with the elevated lead contamination is proposed under action at the nearby Hog Point Site.

Cluster 14 Unknown Tank and Building E5803 Underground Storage Tank (UST) Area. One water and sludge sample was taken from a tank to characterize the contents. One surface water and sediment sample was collected downgradient of the tank to address potential migration of contaminants. All constituents, with the exception of zinc, were detected at levels below background reference values.

Groundwater sampling completed in support of the FS for the Building E5803 UST Area found trace levels of diesel range organics (DRO), and arsenic above the maximum background reference level.

Subsurface soil, sediment, and surface water samples collected within the UST area also contained low levels of DRO, explosives, and gasoline range organics. Further evaluation and possible action could be recommended, under the Compliance Program, for the Building E5803 UST Area.

Planned Actions/Schedule

Ms. Schaefer reported that the Draft Overall FS Report, the Final Radiological Risk Assessment (RA), and Final Overall RI/FS Report are expected in September 2004. The Draft Overall Proposed Plan and Public Comment Period are expected in September or October 2004. The Draft Overall Record of Decision (ROD) is expected in November 2004, with the Final Overall ROD planned for December 2004.

II. OPENING REMARKS AND ADMINISTRATIVE COMMENTS

The August 2004 U.S. Army Garrison Aberdeen Proving Ground (APG) Installation Restoration Program (IRP) Restoration Advisory Board (RAB) meeting was called to order by Mr. Kenneth Stachiw (Chief, Directorate of Safety, Health and Environment (DSHE) Environmental Conservation and Restoration Division (ECRD); Army Co-Chair) at 7:00 p.m. on Thursday, 26 August 2004. The meeting took place at the Edgewood Senior Center located at 1000 Gateway Road in Edgewood, Maryland.

Enclosure 1 to these minutes is a meeting attendance list. RAB Members in attendance received an agenda (Enclosure 2), a RAB calendar of events for September 2004 (Enclosure 3), a copy of the City of Aberdeen Perchlorate Detections maps (Enclosure 4), and a copy of the Westwood Study Area (WSA) presentation (Enclosure 5).

Mr. Frank Vavra (Environmental Protection Agency (EPA)) introduced Ms. Melissa Pennington. Ms. Pennington will be assisting Mr. Vavra with several of the Installation Restoration Program (IRP) sites at APG including Lauderick Creek, Canal Creek, and Other Edgewood Areas. Mr. Vavra stated that Ms. Pennington has been working as a project manager since 1990. Mr. Vavra explained that Ms. Pennington has been working for the past five years in San Francisco and has recently relocated to the Philadelphia area. Ms. Pennington will be taking over several projects that were previously being handled by Mr. Don McLaughlin. Mr. Stachiw welcomed Ms. Pennington and stated that he looked forward to working with her in the future.

Mr. Stachiw informed RAB Members that the next Performanced-Based Contract (PBC) Subcommittee Meeting has been scheduled for 20 September 2004. Mr. Stachiw received comments from Mr. Ted Henry (RAB Member) and Ms. Glenda Bowling (RAB Member, Aberdeen Proving Ground Superfund Citizens' Coalition (APGSCC)). The comments will be discussed during the September PBC Subcommittee Meeting.

Mr. Stachiw stated that no Installation Action Plan (IAP) discussion will be held during the August RAB Meeting because all IAP information for the Westwood and O-Field Study Areas was covered during the 29 July 2004 RAB Meeting.

Mr. Stachiw stated that RAB Members previously requested a discussion of munitions and how they relate to the IRP. A detailed discussion is planned for the 30 September 2004 RAB Meeting. Mr. Naren Desai will be in attendance to discuss munitions along with providing an update on the Other Aberdeen Areas Study Area. Mr. Stachiw stated that approximately 20 sites have been targeted for munitions investigation. An Army Environmental Center (AEC) representative completed a life cycle cost estimate of approximately $120 million for the cleanup of munitions. More precise details will be provided during the September RAB Meeting.

After confirming RAB Members had no further comments, Mr. Stachiw provided an update on the perchlorate detections in the Aberdeen Area of APG.

III. PERCHLORATE DETECTIONS UPDATE

Mr. Stachiw displayed slides depicting results from the latest rounds of perchlorate sampling. The perchlorate detections reported from the 3 August 2004 sampling event ranged from non detect in City of Aberdeen Production (CAP) Well 9 after filtering, to 0.99 J parts per billion (ppb) in CAP Well 11. A result of 0.22 J ppb was reported for the finished water. Concentrations reported from the 17 August 2004 sampling event ranged from non detect in CAP Well 9 after filtering, to 2 ppb in CAP Well 3. A result of 0.16 J ppb was reported for the finished water.

Mr. Stachiw speculated that the abundance of rain during July may have resulted in an overall decrease in the detected concentrations of perchlorate. Mr. Stachiw added that higher concentrations were still observed at Wells 3. Mr. Stachiw stated that the filter installed on Well 9 seems to be working effectively. Consideration is being given to the installation of filters on Wells 3, 10, and possibly 8.

Mr. Stachiw reported that no further information has become available with regard to Strategic Environmental Research and Development Program (SERDP) funding for perchlorate-contaminated soil cleanup. Mr. Stachiw stated that RAB Members will be informed via e-mail when any new information becomes available with regard to perchlorate cleanup.

Mr. Arlen Crabb (RAB Member) reported that a boat tour for the RAB Members was conducted to view the shorelines of the Edgewood Area of APG. The boat tour was held on 8 August 2004. Mr. Crabb stated that several RAB Members were concerned with the number of boaters observed along the shoreline, specifically one boater that was fishing off Maxwell Point. Mr. Crabb reported that the tour allowed the RAB Members to view some of the revetments that were installed at J-Field, along with the shorelines of Carroll Island and Graces Quarters.

Mr. Henry agreed with Mr. Crabb that the tour was worthwhile and informative. Mr. Henry requested a boat tour be scheduled during the Fall 2004 to view the shoreline of the Aberdeen Area of APG. Mr. Stachiw stated that Ms. Katrina Harris (General Physics Corporation) will contact the RAB Members to determine a suitable date and time for the tour. Mr. Stachiw suggested that the tour take place in September or October in an attempt to have suitable weather and enough daylight to conduct the trip in the late afternoon. Mr. Stachiw also suggested that, in an effort to save travel time, the tour could launch directly from the Aberdeen Area.

Mr. John Fairbank (Maryland Department of the Environment (MDE)) stated that a question was raised during the July 2004 RAB Meeting with regard to a letter that was sent from MDE to the City of Aberdeen regarding perchlorate. Mr. Stachiw stated that a copy of the letter was to be provided to all RAB Members. Mr. Henry confirmed that a copy of the letter was included as an attachment to the memorandum of responses to past action items. Mr. Stachiw reiterated that the letter mandated that the City of Aberdeen notify the public if the detected concentration of perchlorate in finished water exceeded 1 ppb, but not if the concentration equaled 1 ppb.

Mr. Henry stated that, with regard to the past action item for the non-stockpile guide, only Mr. Henry was provided with a copy. Mr. Henry requested that additional copies of the guide be obtained and distributed to all RAB Members.

After confirming RAB Members had no further comments, Mr. Stachiw reported that, due to a death in her family, Ms. Cindy Powels (DSHE ECRD Project Officer) would not be providing the Westwood Study Area (WSA) update. Mr. Stachiw then introduced Ms. Jennifer Schaefer (General Physics Corporation) to provide the WSA update.

IV. WESTWOOD STUDY AREA UPDATE

Ms. Schaefer reported that the WSA update provided during the July 2004 RAB Meeting covered the Radiological Risk Assessment (RA). The August Meeting will conclude the WSA update with a discussion of the WSA Feasibility Study (FS).

Ms. Schaefer stressed that no decisions or commitments have been made with regard to the FS remedial alternatives and cost estimates being presented. All efforts are preliminary and have not been submitted through the formal review process for the Draft FS Report.

Feasibility Study Update

Ms. Schaefer displayed maps locating the FS sites both west and east of Reardon Inlet. The locations included the three Operable Unit (OU) sites along with several additional potential source areas that required additional field investigation to support the FS work being completed. Mr. Stachiw stated that the RAB Members could use these two maps as references if questions arose later in the presentation. Mr. Stachiw also noted that a poster board map of the WSA is displayed for use by RAB Members. The poster board map shows the proximity of the WSA to schools, residential areas, and other off-post areas located adjacent to the WSA.

Hog Point Site - OUA. Ms. Schaefer pointed out the location of the Hog Point Site on the poster board map, stating that the site is located adjacent to the Gunpowder River. During the 1940s and 1950s the Hog Point Site was used as a gas mask obstacle course. Through the 1970s, the site was used for testing and training activities, as well as for demilitarization of munitions.

Ms. Schaefer displayed a map showing the RI surface soil sampling locations and results for the Hog Point Site. Six surface soil samples were collected in an area south of the access road that exhibited stressed vegetation. The RI and RA concluded that metals and polyaromatic hydrocarbons (PAHs) in surface soil were the primary human health and ecological risk drivers for the Hog Point area. The primary metal contaminants of concern (COCs) detected during RI sampling included arsenic, cadmium, copper, lead, and zinc. The PAHs COCs identified at the site included benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

Mr. Henry asked if the "K" next to the lead results indicated thousands, or was used as a qualifier. Ms. Schaefer stated that the K is a validation qualifier.

Ms. Schaefer displayed a slide depicting the RI groundwater sampling locations and arsenic results for the Hog Point Site. The RA concluded that arsenic in groundwater was a human health COC. The arsenic detections in groundwater were sustained through the RI sampling at concentrations slightly above the drinking water maximum contaminant level (MCL) of 10 ppb.

Ms. Schaefer displayed a map depicting the FS surface soil sampling results. As a result of the RI and RA, additional sampling was completed to determine the extent of contamination in surface soil. Additional investigation was completed for groundwater and subsurface soil to characterize vertical profile of arsenic contamination to determine correlation with the arsenic contamination in groundwater. In addition to media sampling, an x-ray fluorescence (XRF) soil survey was completed over the entire

Hog Point Site. The XRF survey assisted in the location of additional areas of primarily arsenic contamination outside of the two hot spot locations. Once the XRF survey was completed, the surface and subsurface sampling and test digs were focused in the identified areas.

Mr. Henry asked for clarification that the XRF survey was used as part of the reasoning for where the test digs were located. Ms. Schaefer confirmed that the XRF survey supported selection of the test dig locations. Mr. Henry asked what other reasons were used in locating the test digs. Ms. Schaefer stated that the groundwater and soil samples collected in the area provided knowledge as to where the initial hot spot areas were located.

Mr. Crabb questioned if the Hog Point Site was a high bluff area. Ms. Schaefer confirmed that the area had a high bluff and pointed out the bluff area on the map. Mr. Crabb questioned how much erosion has occurred in the bluff area. Mr. Stachiw stated that erosion is a problem along the Hog Point Area shoreline. Ms. Schaefer added that several feet of shoreline adjacent to the hotspot area were lost during Hurricane Isabel. Mr. Crabb expressed interest in visiting the site to observe the bluff area.

Mr. Henry asked for clarification of historical uses at the Hog Point Site. Ms. Schaefer stated that the area was historically used as a gas mask obstacle course during the 1940s and 1950s. The US Army Technical Escort Unit (TEU) then used the site for testing, training, and munitions demilitarization activities. Mr. Henry asked if the entire OUA area was used for the aforementioned activities. Ms. Schaefer confirmed that the Hog Point Site and a portion of Cluster 10 were both used for those activities. Mr. Crabb asked if the area was currently active. Ms. Schaefer stated that the area is not active for testing and training activities, or for demilitarization of munitions.

Ms. Schaefer displayed a map showing the FS soil direct push technology (DPT) sampling locations and associated arsenic results. Ms. Schaefer explained that, in an effort to characterize the vertical extent of arsenic in soil in the Hog Point Area, a series of DPT subsurface soil samples were collected at several intervals. Samples were collected at the surface and in the upper, middle, and lower portions of the vadose zone above the aquifer. Arsenic was detected in the majority of surface soil locations, but the arsenic concentrations decreased significantly as the samples progressed down to the 4-foot layer and below. The deeper subsurface soil samples detected low levels of arsenic, with many concentrations being at or below the background level of 5.29 parts per million (ppm). Sampling results established that arsenic is leaching quickly through the subsurface soils. One reason for the leaching is the geology at the site. At the Hog Point Site the vadose zone soils are sands and gravels. Arsenic has an affinity for clays and silt and therefore does not linger in the vadose zone at the Hog Point Site. Also a paleochannel begins in the area and extends downward towards the mouth of Reardon Inlet.

Mr. Fairbank asked if the geophysics completed for the Hog Point Site identified any buried materials. Ms. Schaefer stated that no large-scale anomalies were identified that would indicate disposal areas. The geophysics did identify several individual anomaly locations.

Mr. Henry asked if the subsurface soil samples were analyzed for other compounds in addition to arsenic. Ms. Schaefer explained that the samples were analyzed for Target Analyte List (TAL) metals but the sampling was focused on arsenic due to previous arsenic detections in groundwater sampling. No other metals were detected at concentrations exceeding background levels.

Mr. Henry asked if an assumption could be made that, in the area where lead was detected on surface at 9,000 ppm, the concentrations would decrease in deeper subsurface soil samples. Mr. Gary Nemeth (General Physics Corporation) agreed the assumption could be made, but qualified that lead is not as

mobile as arsenic. Mr. Nemeth explained that the partition coefficient between soil and water for arsenic is lower than for many of the other metals, thus making arsenic more mobile.

Ms. Schaefer displayed a slide depicting a map of the FS groundwater DPT sampling locations and associated arsenic results. Groundwater samples were collected from the surficial aquifer in the same locations where the subsurface soil samples were collected. In general, the higher levels of arsenic detected in groundwater were found at sampling locations below the main access road to the Hog Point Site. The area below the main access road is the area of the Hog Point Site where demilitarization of munitions was historically conducted.

Mr. Henry asked Ms. Schaefer to point out the locations of the demilitarization activities. Ms. Schaefer illustrated the locations on the map stating that several buildings historically present on the site were used for demilitarization purposes. Mr. Henry asked for a clarification of the term "demilitarization building". Ms. Schaefer explained that a demilitarization building housed demilitarization operations. Mr. Henry asked if the munitions were being detonated. Ms. Schaefer stated that the munitions were not being detonated. Mr. Nemeth added the operations at Hog Point most likely involved the destruction or dismantling of ordnance items. Mr. Nemeth explained that demilitarization sometimes involved processes such as disassembly, destruction, and open pit burning. The exact nature of the demilitarization operations at the Hog Point Site is unknown.

Mr. Henry asked if a hypothesis had been formed to attribute the metals contamination in the area to the former demilitarization operations. Mr. Nemeth stated that some of the metals contamination could most likely be attributed to the demilitarization operations. The arsenic contamination is most likely a result of training operations using munitions containing adamsite and lewisite. Mr. Nemeth explained that the other metals were concentrated in two other areas, reportedly associated with demilitarization operations.

Ms. Schaefer displayed a slide showing a map of proposed remedial areas for arsenic and lead in soil. The areas of proposed remediation were developed based on the conclusions from the RI and RA, and the additional sampling that was completed in support of the FS. Ms. Schaefer explained that the map also includes the identified COCs from the RA (Areas A and B). The remaining areas were those areas found to contain arsenic contamination (Areas C through H).

Ms. Schaefer presented the three different proposed soil remedial areas based on proposed arsenic remedial goals of 38 ppm, 57 ppm, and 85 ppm. The 85-ppm cleanup level was based on human health risk with a hazard quotient of 1 for construction workers. The 57-ppm cleanup level was established based on modeling of the predicted concentration of arsenic leaching from soil to groundwater. The 57-ppm concentration in soil will prevent the arsenic level from exceeding the MCL in the groundwater when averaged across the aquifer. The 38-ppm cleanup level would be protective of soil invertebrates. The 38-ppm level is also based on human health cancer risk of 10^{-4} for hypothetical residential use.

Ms. Schaefer stated that the estimated remedial volumes (in-place) for the different remedial goals are 265 cubic yards (cy) for Area A; 1,757 cy for an arsenic cleanup level of 85 ppm; 3,680 cy for an arsenic cleanup level of 57 ppm; and 9,333 cy for an arsenic cleanup level of 38 ppm. The average depths for the areas would be approximately 2 feet for Area A, 4 feet for Area B, and 3 feet for the 35-, 57-, and 85-ppm cleanup levels.

Mr. Fairbank questioned whether the cleanup goal would be met or exceeded, based on the proposed remedial volume. Mr. Nemeth explained that the FS has presented cost information associated with remediating the Hog Point Site to several different levels. At this time the FS does not present costs for remediating to a level below 38 ppm due to the amount of uncertainty associated with concentrations

below 38 ppm. The majority of the data points on the map depicting the remedial areas are XRF survey points. The detection limit for the XRF survey was in the 30 to 40 ppm range. Therefore, if a cleanup level of less than 38 ppm is desired, much uncertainty would remain as to how large an area would need to be excavated or capped. Mr. Nemeth stated that the remedial goals presented are just options and costs for several different proposed levels. To date, no decision has been made as to which remedial goal will be implemented.

Mr. Fairbank asked for clarification of the areas on the map. Mr. Nemeth explained that, for example, the 57-ppm contour line denotes the area inside which the arsenic concentrations are equal to or greater than 57 ppm. Mr. Fairbank questioned if the associated cost estimate for the 57-ppm goal would be representative of a cleanup that would lower the arsenic levels to 57 ppm. Mr. Nemeth confirmed.

Mr. Stachiw asked for the risk number for arsenic in soil for residential or industrial use. Mr. Nemeth stated that the proposed remedial goals for the Hog Point Area would fall within the cancer risk range of 10^{-4} to 10^{-5} for industrial workers. Mr. Stachiw asked if that was an acceptable risk. Mr. Nemeth explained that the EPA target cancer risk range is from 10^{-6} to 10^{-4}, with a preference of being as close to 10^{-6} as possible. Mr. Nemeth added that it is not practical to reach the 10^{-6} risk level due to the fact that the cancer risk associated with naturally occurring arsenic is 10^{-6}.

Mr. Vavra expressed concern that the risk ranges and associated concentrations do not sound correct. Mr. Vavra stated that, for residential exposure, a 10^{-6} cancer risk would equate to an arsenic concentration of 0.43, and 10^{-4} would be an arsenic concentration of 43. Mr. Nemeth stated that the concentrations he was speaking of were for industrial use. Mr. Vavra asked which remedial goal Mr. Nemeth was referring to that would equate to a risk of 10^{-5}. Mr. Nemeth stated that all of the proposed remedial goals fall between the risk range of 10^{-4} and 10^{-5}. Mr. Nemeth explained that the risk calculations completed for an outdoor industrial worker resulted in the following arsenic concentrations: 1.8 for 10^{-6} risk, 18 for 10^{-5} risk, and 180 for 10^{-4} risk.

Mr. Henry asked, with regard to the 265 cy remedial volume estimated for Area A, what contaminants will be removed. Mr. Nemeth explained that lead and other metals are the contaminants of concern in Area A, and added that arsenic is not a primary constituent in that area.

Ms. Schaefer reported that several remedial alternatives have been proposed for the Hog Point Area. The No Action alternative would cost approximately $110,000 and would include site-closeout documentation, and five-year remedy reviews. Additional alternatives under consideration involve excavation of contaminated soil to the three different arsenic remedial goals. Those alternatives would include removal of arsenic and lead contaminated soil, some type of groundwater monitoring, and off-site soil disposal. Off-site disposal of the soil would be necessary, not because of any known hazardous content, but because of the leaching of arsenic through the soil. The proposed costs associated with excavation and disposal would be $1,302,000 for the arsenic remedial goal of 85 ppm, $1,996,000 for the arsenic remedial goal of 57 ppm, and $4,115,000 for the arsenic remedial goal of 38 ppm. The final proposed remedial alternative involves consolidation and capping of contaminated soil. The intent of this alternative is to excavate soil in the other areas of the Hog Point Site except for areas C and D. The cap would cover areas C and D and the contaminated soils excavated from the other areas at the Hog Point Site would be placed under the cover. The $3,066,000 cost for this alternative includes a perimeter access road around the cap, fencing, groundwater monitoring, and shoreline stabilization along the Gunpowder River.

Mr. Stachiw added that the final alternative presented is similar to an alternative that was implemented at J-Field. The solution involved consolidating contaminated materials in one location, capping it, and then protecting the shoreline. Mr. Stachiw stressed that it is critical to make the correct decision with regard to

the Hog Point Site. By implementing the capping alternative with shoreline protection, Defense Environmental Restoration Account funding would be available. Otherwise, shoreline protection for the area would not be addressed until the Installation was ready to implement protection. The Installation chooses areas of shoreline protection based on priority, and Mr. Stachiw speculated that other areas on post have a higher priority for shoreline protection. Mr. Stachiw stated that an excavation alternative would remove the lead and arsenic contamination from the soil, but with no shoreline protection, erosion would result in the land not being available for future use.

Mr. Fairbank informed the RAB Members that the Corps of Engineers had planted 27,000 ferns in Spring Valley to address arsenic contamination. Mr. Fairbank suggested that the same technique be considered for remediating arsenic at the Hog Point Site. Mr. Nemeth explained that the fern concept was considered in the FS but was not carried forward for detailed analysis. A concern existed that the ferns would only extract the arsenic within the plant's root zone, which is fairly shallow. Mr. Nemeth agreed that the highest levels of arsenic were detected in the top layer of soil, but high levels were also detected in deeper soil samples, and would not be affected by planting ferns. Mr. Fairbank suggested that the ferns could be used in combination with another remedial alternative such as hot spot removal or planting the ferns on an area of consolidated soils with elevated arsenic levels. Mr. Vavra added that the success of the implementation of ferns in Spring Valley has not been evaluated, as the project has just begun. Mr. Vavra stated that using ferns to extract arsenic is a very slow process, reducing arsenic concentrations approximately 1 to 3 ppm each year. Mr. Fairbank agreed, adding that the Spring Valley project is expected to be completed in four years. Mr. Stachiw cautioned that using ferns will not turn the arsenic into something else, and the arsenic contamination will remain in the ferns for disposal.

Mr. Henry questioned Mr. Nemeth's statement that high concentrations of arsenic were observed in the deeper soil samples. Mr. Henry stated that the highest arsenic concentration on the map detailing the soil DPT sampling results was 18 ppm. Mr. Nemeth stated that the results on the map depict the average arsenic concentration over depths of 6 inches to 4 feet. The highest levels of arsenic were detected in the top 12 to 18 inches. Mr. Nemeth explained that if a low cleanup level is desired, phytoremediation would be a very expensive option, partly because of the large size of the area and multiple growing seasons that would be needed to reduce the arsenic concentrations. Mr. Stachiw stated a cost estimate could be derived for using phytoremediation with ferns for the arsenic contamination identified at the Hog Point Site.

Mr. Henry requested additional information regarding the erosion rates for the Hog Point Site, in particular for Areas A and B. Mr. Henry speculated that the rates could possibly be one to two feet per year. Mr. Henry added his concern regarding the need to determine the ecological risks that would be associated with contaminated soil eroding into the Gunpowder River at the mouth of Reardon Inlet. Mr. Nemeth explained that the erosion rates are not easily determined on a per year average. The major erosion losses along the shoreline occur during large storm events, specifically those events that result in high winds, wave action, and water levels.

Mr. Fairbank asked if soil samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) tests to assess arsenic leaching. Ms. Schaefer stated that TCLP tests were completed, and no hazardous contaminants were identified.

Mr. John Paul (DSHE ECRD) stated that the 38-ppm remediation goal was established based on soil invertebrates, and added that the remediation goal could be higher for contaminated soil deeper in the profile. Mr. Paul added that the next highest arsenic remediation goal was for vermivorous birds, at 75 ppm, based on the ecological RA.

Mr. Nemeth stated that he used the EPA's soil screening guidance to run a leachate model to determine soil cleanup levels that would be protective of groundwater. The crude model gives a baseline of remediation levels in soil necessary to protect groundwater. If a more sophisticated model was desired, more data would need to be collected from the site for the model to be accurate. Mr. Nemeth explained that the aquifer in the Hog Point Area is in the area of a paleochannel, and is fairly thick, approximately 67 feet. In order to not exceed the MCL in even the uppermost portion of the aquifer, the model requires a soil cleanup level of approximately 11 ppm. Mr. Nemeth added that the 57-ppm remediation goal is the level at which the arsenic leaching into the aquifer would remain in the top 10 to 15 feet of the aquifer, with a concentration of approximately 50 ppb. Even with a higher concentration in the uppermost portion of the aquifer, the average concentration across the entire aquifer would not exceed 10 ppb, which is the MCL for arsenic.

Mr. Vavra added that it is important to also look at the soil characteristics and different types of arsenic that may be present at the site. Characteristics such as where the arsenic was derived and the complexity of the arsenic could affect the bioavailability of the arsenic or its ability to leach through the soil. Mr. Vavra suggested completing a Synthetic Precipitation Leaching Procedure (SPLP) type test to determine true leaching conditions in the soil. Mr. Nemeth agreed, stating that the same types of tests are required when dealing with bioremediation to determine the availability of the contaminants.

Mr. Henry asked if any leaching tests have been completed using actual soil samples from the Hog Point Site. Mr. Nemeth stated that, with the exception of the TCLP tests, no site-specific analysis has been completed that would calculate leachability or site-specific K_d (partition coefficient) values. Mr. Nemeth reiterated that more data would be required if a more sophisticated model was used to determine leachability. Mr. Vavra repeated his suggestion that it would be worthwhile to complete several SPLP tests. Mr. Nemeth stated that he did review the Sequential Extraction Procedure (SEP) data that was generated from samples gathered from Areas A and B of the Hog Point Site. The SEP fractions for those samples did not contain any arsenic data, therefore the information was not helpful.

Mr. Stachiw stated that a fair amount of information has been presented with regard to the Hog Point Site. The contaminated soil on site has a potential for arsenic leaching into the groundwater and a potential exists for the areas to erode into the Gunpowder River. Mr. Stachiw stated that he is not opposed to pursuing further data, but cautioned that additional data may not provide any more useful information that would help in determining the appropriate course of action for the Hog Point Site, and additional field work may result in identification of additional uncertainties. Mr. Stachiw stated that the information from the Hog Point Site should be evaluated to determine an appropriate cleanup level. Consideration should be given to the remediation for the site such as excavating soil with the possibility of more of the shoreline eroding in the future or excavating soil and implementing some type of shoreline protection. Mr. Stachiw reiterated his concern that the Installation would protect other areas of shoreline on post to protect areas with facilities and roads, before the Hog Point Site shoreline is protected. Also, the Installation may not see a need to protect the shoreline in the Hog Point Site if the contaminated soil is removed from the site. Mr. Stachiw reiterated that he is not opposed to pursuing additional data for the site, but would like it to be in parallel with a remedial alternative at the site, as opposed to in series.

Mr. Henry asked for the timeframe of implementing an action at the Hog Point Site. Mr. Stachiw explained that a Record of Decision (ROD) must be finalized before a remediation is implemented. Mr. Stachiw stated that a ROD can take anywhere from one to nine months to complete once the Proposed Plan (PP) is completed. Mr. Stachiw stated that he believed that, if needed, additional information could be collected during those stages. Mr. Vavra stated that is why he suggested completing SPLP testing. Mr. Vavra added that the proposed remediation goals will still exceed the MCL in groundwater, creating a groundwater policy issue. Mr. Vavra stated that arsenic contamination in the groundwater has already been established. Therefore it is critical to define whether or not a particular remediation goal would

produce MCL exceedances. Mr. Vavra stressed that the EPA would most likely be concerned about the groundwater contamination, especially if no active groundwater remediation is proposed for the area.

Mr. Stachiw encouraged all RAB Members to provide comments with regard to the need for additional information to be gathered, or for which remedial alternative should be pursued. Mr. Stachiw stressed that no direction has been chosen as to the remediation for the Hog Point Site. Mr. Stachiw added that the remedial alternative that will be chosen is above an APG level, and AEC must approve expenditure of funds.

Mr. Henry asked when the FS would be published. Mr. Stachiw explained that the presentation given was part of the Draft FS. Mr. Henry asked if the FS would include a proposed remedial alternative including a combination of possible capping and securing the shoreline. Mr. Stachiw confirmed the combination would be addressed in the Draft FS. Mr. Henry reiterated his concern that erosion rates for the Hog Point Site should be established. Mr. Henry stated that a crude estimate could be made by reviewing a map from 20 years ago and measuring how many feet of shoreline have been lost and averaging it over the years. Mr. Henry added that the actual erosion rate would most likely be higher than the crude estimate. Mr. Stachiw stated that the erosion rates would be determined.

Gas Mask Factory - OUB. Ms. Schaefer reported that the Gas Mask Factory site is located along the West Branch of Canal Creek. The site is located in a wooded area behind the former Gas Mask Factory. Waste material identified in several small dump areas at the site included whetlerite screening fines, gas mask filter remnants, burned material and metal. During the RI and RA the primary human health COCs identified in surface soil included PAHs (benzo(a)pyrene, benzo(b)fluoranthene) and metals (arsenic, cadmium, copper, lead, and zinc). The ecological COCs in surface soil identified in the RA included arsenic, cadmium, copper, lead, and zinc.

Ms. Schaefer displayed a map showing the RI surface soil sampling locations and results. The sampling locations were focused on the visible dump areas that were observed during site reconnaissance. Ms. Schaefer displayed a map showing the FS media sampling results. Based on the RI and RA conclusions, additional field work was needed to further characterize the extent of the metals and PAH contamination at the site. Test digs were conducted to gather subsurface soil information to estimate the volume of waste at the site.

Ms. Schaefer reported that an XRF survey was completed to assist in establishing a boundary of metals contamination in the surface soils. The survey also identified several more dump areas along the Canal Creek Marsh. Ms. Schaefer pointed out the dump areas on the map, labeled A through K. Additional surface soil and sediment samples were collected at the site. Test digs were also completed at the waste area locations to obtain information on volume estimates and to determine if the metals were vertically leaching. The test dig effort indicated that the average thickness of waste materials ranged from 1 foot at Dump Areas E and F to 6 feet at Area B. With the exception of Area E, the waste material found in the dump areas included primarily metals components, gas mask filter canisters, and whetlerite materials mixed with burn material. At Area E, no solid waste material was observed. Waste at Area E was whetlerite material that was spread or graded just under the topsoil layer.

Mr. Henry asked for a detailed explanation of the procedures used for the test digs and associated subsurface soil sampling. Mr. Henry inquired at what depth the subsurface soil samples were collected and the depths at which the test digs were completed. Ms. Schaefer explained that the map showing the FS media sampling results only depicted the results from the surface soil sampling effort. The specific test dig effort varied from each test dig location. In general the test dig proceeded down through the waste material until native soil was reached, and no visible waste or staining was observed. A subsurface

soil sample was then collected from that depth. Ms. Schaefer explained that, in all test dig locations, the subsurface soil samples detected only very low levels of COC metals. The low levels indicate that the metals are not leaching downward through the soil profile. Ms. Schaefer stated that, based on the topography of the area, most of the metals transport is through surface water runoff into the marsh area.

Mr. Henry stated in Area A the concentration of copper in the surface soil was 72,000 ppm. Mr. Henry asked Ms. Schaefer to confirm when the test dig was conducted to a depth where native soil was observed, the associated subsurface soil sample did not detect copper at a concentration that would be of concern. Ms. Schaefer agreed.

Ms. Schaefer reported that the surface soil and sediment sampling results indicated that the majority of metals concentrations decreased very quickly at locations 15 to 20 feet away from the visible waste areas at each of the dump locations. Ms. Schaefer added that the sampling identified an additional area of elevated lead concentrations in surface soil within a drainage pathway north of Dump Site B. The concentrations of lead in surface soil within the drainage pathway ranged from 451 ppm to 13,200 ppm.

Mr. Henry asked for the timeframe of when the dumping occurred in the Gas Mask Factory area. Ms. Schaefer stated that the factory was in operation during the 1940s through the 1960s.

Ms. Schaefer displayed a map showing the proposed remedial areas for lead in soil. Lead was the driver for the extent of remedial areas at the Gas Mask Factory site because none of the other metals had a larger extent at the dump site locations. The map also shows an overlay of the XRF locations from the soil screening survey that was completed for the site. The proposed remedial goal for lead was determined to be 421 ppm. Mr. Nemeth explained that the 421-ppm goal was based on the fact that the number is similar to the ecological soil invertebrate remedial goal number of 411 ppm and the human health remedial goal numbers for construction and outdoor workers of 425 ppm and 449 ppm.

Ms. Schaefer reported that the estimated remedial volume (in-place) for the Gas Mask Factory Site is 1,428 cy. The proposed remedial alternatives and associated costs include no action ($110,000), excavation of waste and contaminated soil with inclusion of the drainage area ($626,000), and excavation of waste and contaminated soil without inclusion of drainage area ($567,000). No other alternatives were considered due to the small size of the waste areas. The waste areas ranged in size from 11 cy to 390 cy.

Mr. Fairbank asked if the Gas Mask Factory alternatives were representative of off-site disposal. Ms. Schaefer explained that the alternatives assume primarily on-site disposal. Mr. Nemeth explained that during calculations, he assumed a very small percentage of waste could be hazardous and would require off-site disposal. The bulk of the waste was assumed to be non-hazardous and would be consolidated to another Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) site at APG for use as a base layer prior to capping.

Mr. Henry asked for the assumed depth to reach the remediation goal, or if the excavation proceeded to the depth necessary to achieve the 421-ppm goal. Mr. Nemeth stated that the depths required to reach the 421-ppm goal are well known due to the information gathered from the test digs. Ms. Schaefer stated that the depths range from 1 to 6 feet. Mr. Stachiw reiterated that, at those depths, the lead remediation goal of 421 ppm would be reached. Mr. Nemeth agreed. Mr. Henry questioned if other metals would be included for analysis in the confirmation sampling. Mr. Nemeth stated that all metals would be included for analysis. Mr. Nemeth added that, based on the data obtained with regard to the lateral and vertical extent of contamination, if the lead contamination is remediated, it is assumed that most all other metal contamination would be remediated as well. Mr. Nemeth stated that he could develop an estimate that would reflect the cost associated with transporting all the waste off-site versus managing a portion of the waste on-site.

Mr. Henry questioned why the disposal areas are randomly scattered across the site. Mr. Nemeth stated that the random placement is a result of how the dumping was conducted. Ms. Schaefer stated that the XRF was conducted on a small grid pattern of 50-foot spacing. Mr. Henry asked if geophysics were conducted at the Gas Mask Factory Site. Ms. Schaefer confirmed that geophysics were conducted in the area. Mr. Henry asked if the geophysics corroborated the data from the XRF survey results. Ms. Schaefer explained that the larger dumping areas such as areas B, F, J, and K, were identified during the geophysical survey. Several of the smaller dump areas such as A, and E were not identified during the geophysics. Ms. Schaefer added that the site was heavily wooded, thus making it difficult or impossible to traverse some of the sites with the equipment used during the geophysics survey. Mr. Henry asked if the data were evaluated to ensure that no geophysics data was identified that did not have an associated XRF survey point or other media sampling location. Ms. Schaefer stated that the geophysics were evaluated in combination with the XRF survey to ensure that no data gaps remain for the Gas Mask Factory Site.

Mr. Nemeth stated if the remedy chosen for the Hog Point Site included a low permeability cap, waste from other WSA locations could be consolidated at the Hog Point Site prior to capping. Mr. Stachiw agreed that scenario would be a possibility. Mr. Vavra reiterated that leachability could create a problem. For example, at the Cluster 3 site in Bush River, the same remedy is proposed. The Cluster 3 site has a lead contamination issue, but the lead does not pose a leaching problem. The lead contaminated soil is planned for placement at the 22nd Street Landfill. Mr. Vavra explained that a portion of the 22nd Street Landfill is under water, and because the lead is not leaching, it is an appropriate placement location. Mr. Vavra cautioned that placing arsenic contaminated soil at the 22nd Street Landfill should not be considered due to the potential for leaching. Mr. Nemeth agreed, and stated that the Hog Point soils should not be placed at any other site on-post. The material would either be transported off-post, or consolidated and capped at the Hog Point Site.

Mr. Fairbank stated that, due to the small volumes being discussed within the WSA locations, it could be possible to create one small impermeable cap and place all contaminated soils underneath. Mr. Fairbank suggested that the cap could be located at a site other than Hog Point to alleviate the concern of erosion. Mr. Stachiw stated that the possibility would depend on the location chosen. Creating a new site would be problematic but consolidating soils in conjunction with an existing site could be a possibility. Mr. Nemeth stated that the WW-90 Fill Area is a small location, approximately 1 acre in size. Mr. Nemeth speculated that the Fill Area site could be a good consolidation area due to an almost negligible cost difference between a simple soil cover and low permeability.

Brine Sludge Disposal Area - OUC. Ms. Schaefer stated that the Brine Sludge Disposal Area measures approximately 2,000 square feet and is located adjacent to the Canal Creek marsh. A chlorine manufacturing facility was historically located on the site and was in operation during World War I. Historic records indicate that brine sludge was dumped or discharged to the marsh area downgradient of the plant. During the RI and RA, the primary human health COCs identified for surface soil include arsenic, chromium, copper, iron, and manganese. The ecological COCs identified by the RI and RA for surface soil include arsenic, copper, and zinc. Ms. Schaefer displayed a map depicting the RI surface soil sampling results.

Ms. Schaefer displayed a slide depicting media sampling and results completed in support of the FS. Additional surface soil samples were collected to further bound the horizontal extent of the surface soil RI locations. Two test digs were completed within the waste area, and two test digs were completed upgradient of the waste area. Sediment samples were also taken from locations downgradient of the disposal area.

Ms. Schaefer stated that test dig efforts within the brine sludge disposal area indicated that only the top 1 to 2 feet of waste within the site are strictly brine sludges. An additional 15 inches of burn residue and metal remnants remain beneath the brine layer. The two upgradient test dig locations did not identify the presence of brine material, waste material, or stained soil. Ms. Schaefer reported that the media sampling results indicated a migration of contaminants from surface soils to downgradient sediment points, into the marsh area.

Mr. Henry asked if a sediment sampling point was located where the two streams converge. Ms. Schaefer confirmed that a sediment sampling point was placed at the location. Mr. Henry asked if any elevated hits were detected at that location. Ms. Schaefer stated that no elevated hits were identified.

Ms. Schaefer displayed a map showing the proposed soil remedial area for the Brine Sludge Disposal Area. The area is well defined based on the surface soil and test dig sampling that was completed in the area. Ms. Schaefer reported that the estimated remedial volume (in-place) for the Brine Sludge Disposal Area is 192 cy. The proposed remedial alternatives and associated costs for the Brine Sludge Disposal Area include no action ($110,000), and excavation of waste and contaminated soil ($138,000). Ms. Schaefer explained that a cap would not be a logical alternative due to the small size of the area. On-site disposal was assumed for the excavated waste.

V. INTERMISSION

At 8:20 p.m., after confirming that no one present had further questions, Mr. Stachiw requested a 10-minute break. At 8:30 p.m. the meeting resumed.

VI. WESTWOOD STUDY AREA UPDATE - CONTINUED

WW-90 Fill Area. Ms. Schaefer reported that the WW-90 Fill Area is located along the Installation Boundary near Reardon Inlet and is approximately 1.1 acres in size. No waste is visible on the surface but areas of subsidence are present. Based on geophysical surveys, the magnetic signature (indicating the presence of subsurface fill material) extends approximately 40 feet into the marsh area. Ms. Schaefer pointed out the marsh area and the area of magnetic signature on the poster board map.

Ms. Schaefer displayed a slide depicting the FS media sampling locations and results. A series of four test digs and subsurface soil samples were collected to further characterize the WW-90 Fill Area location. The subsurface soil samples were collected at the base of the waste, or from within the waste area itself. Additionally, three sediment samples were collected downgradient of the Fill Area to determine leachate migration into the marsh, and three surface soil samples were collected from the areas of highest anomalies.

Ms. Schaefer reported that the test dig efforts completed in the Fill Area indicated a topsoil layer over the fill ranging from approximately 9 to 13 inches deep. Some areas of subsidence and animal encroachment into the fill material were noted. The observed waste material included a mixture of household, military, and industrial type material. Based on seismic refraction data, the average depth of waste was found to be 14 to 16 feet. Ms. Schaefer stated that, during the test dig effort, waste or visually stained soil was still being observed at depths of 8 feet. At that depth, water from the surficial aquifer was encountered. The test dig effort was performed by hand digging and auguring to a maximum 10-foot depth.

Ms. Schaefer stated that the subsurface soil samples confirmed the presence of industrial and military type waste at the site. Many organic constituents were detected in the subsurface soil samples including

PAHs, pesticides, and polychlorinated biphenyls (PCBs). The surface soil samples and sediment samples did not detect high concentrations of constituents.

Ms. Schaefer reported that the estimated remedial volume (in-place) for the WW-90 Fill Area is 28,169 cy. The proposed remedial alternatives and associated cost estimates include no action ($110,000), and soil cover and long-term monitoring ($1,948,000). Due to the nature of the waste observed at the site, and the remaining unknowns, it was presumed that excavating the waste would be too costly.

Mr. Stachiw summarized that, at the WW-90 Fill Area, 16 feet of waste is present that lies at least partially in water. Mr. Stachiw added that the site may contain hazardous materials, and it would be near impossible to prove their presence or lack there of without excavating the entire site. Mr. Stachiw explained that one approach for remediation of the site would be to cap the waste to be protective of any ecological or human receptors. The cap would not prevent any contaminants from leaching into the groundwater. The proposed approach would incorporate a robust groundwater monitoring program to determine if leaching has or has not occurred. Mr. Stachiw explained that he has worked at APG since 1972 and has knowledge that the WW-90 Fill Area did not exist as a landfill at that time, or anytime thereafter. Therefore, the site has been in existence, with waste in the aquifer for at least 30 years. Mr. Stachiw speculated that any potential leaching could have already occurred.

Mr. Vavra clarified that the waste is not just in the water table on land, but the waste extends out into the inlet. Mr. Vavra expressed concern that a cap would only cover the waste on land, and would not protect the waste that is under water. Mr. Stachiw stated that the underwater portion of the waste could possibly be dealt with by construction of wetlands at the WW-90 Fill Area or at another location. Mr. Stachiw added that, because of the uncertainty as to the presence of hazardous materials, contaminated waste excavated from the site would have to be disposed of at another location or possibly incinerated. Mr. Stachiw reiterated his support of remediation by capping in conjunction with a robust groundwater monitoring plan.

Mr. Henry asked if surface water was present in the WW-90 Fill Area. Mr. Crabb stated that there is an abundance of surface water on the site, in very close proximity to the road. Mr. Henry requested that, as the WW-90 Fill Area remediation moves forward, consideration be given to ensure that the media sampling completed in the area is sufficient to justify the proposed remediation. Mr. Henry also expressed concern that only three sediment samples were taken. Mr. Stachiw agreed and stated that all sampling should be reviewed to make sure the data is sufficient. Mr. Paul added that no contaminants have been detected in sampling completed in the Reardon Inlet, but the sampling points are not in the immediate vicinity of the WW-90 Fill Area location.

WW-90 Drum Dump Area. Ms. Schaefer reported that the WW-90 Drum Dump is a 0.5-acre site located along the north side of a steep drainage ravine that carries surface water runoff to Reardon Inlet. A small volume of potentially contaminated surface material was removed during March 2001. The material included empty deteriorated 55-gallon and 5-gallon drums, and empty ammunition boxes. Some waste remains in the area including subsurface material that could not be hand-excavated. Site reconnaissance could not determine if the remaining materials are filled or empty.

Ms. Schaefer displayed a map depicting the FS media sampling locations and results. The field effort included test digs, sediment, surface, and subsurface soil sampling. The test dig effort concluded that the subsurface anomalies were too extensive and difficult to recover by hand excavation. Waste material that was removed during the test dig effort included additional 55-gallon and 5-gallon drum remnants, rifle blank casings, braided cable, and miscellaneous metal material. The soil sampling conducted at the WW-90 Drum Dump Area found elevated levels of copper, lead, and zinc. Elevated levels of zinc were also

detected in one sediment sample. One explosive and one pesticide compound were detected during sediment sampling at concentrations below screening criteria and background reference values.

Ms. Schaefer stated that the estimated remedial volume (in-place) is 676 cy. The proposed remedial alternatives and associated cost estimates for the WW-90 Drum Dump area include no action ($110,000), and excavation of waste and contaminated soil ($220,000). The excavation alternative would involve digging up the contaminated waste/soil and consolidating it at another location on post. To date, the cost of further investigation of the site would most likely be equal to the cost of excavating and disposal of the waste.

HC Grenade Disposal Site. Ms. Schaefer reported that the HC Grenade Disposal Site was encountered during an investigation of potentially contaminated surface materials. A total of eight empty and unfuzed HC smoke grenade components and scrap metal were observed on the site. The site is located along a drainage stream that comes off of the Westwood Debris Landfill that leads to the Reardon Inlet. The surface material was removed and a completed magnetic survey identified additional subsurface material.

Ms. Schaefer displayed a map depicting the FS media sampling locations and results. A test dig effort was completed in May 2004 to characterize the site and to possibly remove the material, allowing for site closeout. The test dig effort identified an area of waste material that was much larger than anticipated. The waste material lies not only along the north bank, but extends into the drainage stream sediments. The estimated area of contaminated soil and waste remaining on site is approximately 270 square feet. No detections of volatile organic compounds (VOCs), chemical agent degradation products, explosives, or radiologicals were reported in the surface soil or sediment samples. Low levels of pesticides and a large number of metals were detected in the surface soil and sediment samples. Perchlorate was also detected in one of the surface soil samples. Lead was detected in one of the sediment samples at a concentration in exceedance of the lead remedial goal of 421 ppm. Ms. Schaefer explained that the data supports the possibility of excavation of the waste and contaminated soil and disposing of the material on post.

Ms. Schaefer reported that the proposed remedial volume (in-place) is 40 cy. The proposed remedial alternatives and associated cost estimates include no action ($110,000), and excavation of waste and contaminated soil ($129,000). The cost to complete an investigation of the site would be about equal to the cost of excavating and disposing of the waste.

Westwood Radioactive Material Disposal Facility (WRMDF). Ms. Schaefer reported that the WRMDF is located along the Installation Boundary. The WRMDF is approximately 2 acres in size and was historically used for processing, packaging, and temporary storage of radioactive waste prior to disposal at other locations. A removal action was completed in 1998 that removed Cesium-137 (Cs-137) contaminated soil and underground wastewater structures.

Ms. Schaefer stated that a geophysical survey was completed prior to the FS that included the entire western portion of the WSA. The geophysical survey completed in Cluster 6 area of the WRMDF showed some anomalies located outside of the removal action area. The anomalies were linear in nature. A larger, concentrated group of anomalies was identified in the western area of the site. Prior to the additional FS sampling, test digs were completed in the anomaly areas. The test dig effort in the central and eastern portion of the site indicated the linear anomalies were associated with corrugated drainage pipes and a buried electric utility line. A third linear anomaly at the south end of the site corresponded to a 2-inch diameter water line. The test dig effort within the western disposal area revealed waste comprised of a mix of household and military-related materials. The test dig effort found that the area of waste was much larger than what could be physically removed by hand. The area of buried waste was

found to be approximately 8,400 square feet. Waste removed from the area included empty 55-gallon drums, metal banding strips, ceramic light fixtures, and laboratory and household cleaner glassware.

Ms. Schaefer displayed a map depicting the FS media sampling locations and results. Media sampling detected elevated concentrations of metals and PAHs in the subsurface soil and sediment sampling locations. Ms. Schaefer displayed a map depicting the proposed remedial area for the Western Disposal Area of the WRMDF site, based on the completed geophysical survey.

Mr. Henry asked Ms. Schaefer to illustrate on the map the location of the previous WRMDF and the location of the drainage lines that were previously removed. Ms. Schaefer pointed the areas out on the map and stated that the largest area of remediation was adjacent to Well WW-38. Mr. Henry asked if the area proposed for remediation is a suspected disposal area. Ms. Schaefer stated that the outlined area was determined to be a disposal area, while the linear anomalies were identified as utility lines or other non-waste related material. In the proposed remediation area, observed waste included laboratory glassware, metal materials, and household materials.

Ms. Schaefer reported that the estimated remedial volume (in-place) for the Western Disposal Area is 622 cy. The proposed remedial alternatives and associated cost estimates for the Western Disposal Area include no action ($110,000), and excavation of waste and contaminated soil ($202,000). The cost estimate assumes on-post disposal of contaminated waste.

Ms. Schaefer stated that a previous request was made to go back and investigate the Cs-137 detection in sediment at the Former Headwall location. A level of 72 picoCuries/gram (pCi/g) was detected at the Former Headwall Area. The removal action National Regulatory Commission (NRC) cleanup level for the removal action at the Former Headwall area was 15 pCi/g. Additional sampling is proposed to confirm the Cesium-137 (Cs-137) detection and define the extent of contamination in the former Headwall Area. If required, the contamination will be excavated.

Cluster 2. Ms. Schaefer stated that two additional sites that were evaluated as potential source areas include the Cluster 2 Silver Detection and Paint Can Dump #2. The Cluster 2 Silver Detection location was identified during RI sampling, with silver detected in one surface soil sample at 72 ppm, exceeding the BTAG ecological screening value and the maximum background reference value. The BTAG requested that additional sampling be completed in an attempt to confirm the detection and define the extent of contamination. The Paint Can Dump #2 site is located directly south of the WSA Debris Landfill. Potentially contaminated surface material was previously collected from the Paint Can Dump #2 site. Material collected included paint cans and industrial solvent cans. A magnetometer sweep of the area identified additional subsurface material that remains on site. Additional sampling was completed at the Paint Can Dump #2 Site.

Ms. Schaefer displayed a map depicting the FS media sampling results for the Cluster 2 Silver Detection and Paint Can Dump #2 areas. Additional sampling at the Cluster 2 Silver Detection area included the original RI sampling location, four locations taken approximately 25 feet out from the RI sampling location in all directions, and one sample taken 10 feet downgradient from the RI sample location. No detections of silver were found in any of the additional surface soil samples that were collected.

Mr. Henry asked for the level of confidence that the same sampling location was chosen as was used in the original RI sampling effort. Ms. Schaefer stated that the RI sampling location was relocated using Global Positioning System (GPS). The GPS can locate coordinates to sub-meter accuracy.

Ms. Schaefer reported that one test dig was completed in the Paint Can Dump #2 area to provide anomaly verification and identify any observed metallic waste. During the test dig effort all remaining waste material was removed. One verification soil sample was collected at the conclusion of the test dig. Metals were detected in the soil sample at levels slightly above screening criteria, but not exceeding the proposed human health and ecological remedial goals.

Mr. Fairbank asked what type of paint was in the paint cans removed from the Paint Can Dump #2 site. Ms. Schaefer stated that the cans were very old, with no markings denoting the type of paint. Mr. Fairbank asked if sampling analysis included bis-2-ethylhexyl phthalate. Ms. Schaefer stated that the compound was included in the analysis completed for the soil sample collected from the site.

Ms. Schaefer stated that no further evaluation or active remediation is proposed for the Cluster 2 Silver Detection and Paint Can Dump # 2.

Roads End Disposal Site. Ms. Schaefer stated that the Roads End Disposal Site is a 2.8-acre site located at the mouth of Reardon Inlet on the tip of the peninsula. Aerial photographs taken during the 1960s showed five parallel linear features near the end of the road. The features may have been potential disposal trenches. As part of a larger effort at WSA, a geophysical survey was completed over the area. The survey identified a linear anomaly.

Ms. Schaefer displayed a slide showing the FS media sampling locations and results. As part of the additional characterization of the site, test digs were completed in the area of the linear anomaly, and other locations of high magnetic signature. At most of the locations, the test dig effort recovered mostly hot rock (stones used in railroad beds) and individual metallic objects. The material was located near surface, resulting in a high magnetic signature. No subsurface soil samples were collected from those test dig locations because no waste material was identified that indicated the presence of contamination. Ms. Schaefer stated that test dig location TD-17 identified a braided cable and evidence of a layer of red sand. One sample was collected of the material resulting in detections of PAHs, pesticides, and metals. All detections were in exceedance of background reference levels and screening criteria, but remained below the proposed remedial goals. The test digs completed at the linear anomaly identified a distinct red sand layer at approximately 5 feet below ground surface that gave off a subtle, low-magnitude, magnetic signature. No waste was observed at the linear anomaly location to indicate any buried materials. Ms. Schaefer reported that no further evaluation or active remediation is proposed for the Roads End Disposal Site.

Western WSA Potential Source Areas. Ms. Schaefer stated that a geophysical survey was completed over an approximately 250-acre area to identify any remaining large-scale disposal locations. The WSA historically was used as an active range in the 1940s and 1950s for testing and training activities.

Ms. Schaefer displayed maps showing the FS media sampling locations and results. The geophysical survey identified 29 distinct anomalies where test digs were completed to provide anomaly verification and to identify any observed waste. A subsurface soil sample was also collected from each test dig location to define vertical extent and nature of potential contamination. Metallic material was removed from all but one of the mounds and anomalies during the test dig effort. Sampling results detected mostly metals, with a few VOCs, semivolatiles, chemical agent degradation products, and pesticides. The detected concentrations were below proposed remedial goals.

Ms. Schaefer reported that the location where all waste was not removed during the test dig effort was at CO2-TD-26. The mound measures 8 feet long by 5 feet wide by 3.5 feet deep. Observed waste included small pieces of plastic tubing, degraded batteries, and metal fragments. A soil sample collected from the

mound contained lead at levels exceeding screening criteria and the proposed remediation goal of 421 ppm.

Ms. Schaefer stated that no active remediation is proposed for 28 mounds. Remediation of the remaining mound, CO2-TD-26, with the elevated lead contamination is proposed under action at the nearby Hog Point Site.

Cluster 14 Unknown Tank and Building E5803 Underground Storage Tank (UST) Area. Ms. Schaefer reported that the Cluster 14 tank was located adjacent to the West Branch Canal Creek. The Cluster 14 tank is positioned close to Mound A in the Gas Mask Factory area and measures 10 feet in diameter and is 8 feet in depth. The former UST site is located south of Building E5803 in Cluster 21.

Ms. Schaefer displayed a slide depicting the FS media sampling results for the Cluster 14 tank and Building E5803 UST area. For the Cluster 14 tank, one surface water and sediment sample were collected downgradient of the tank to address potential migration of contaminants. Additionally, one water and sludge sample were taken from the tank to characterize the contents. Low levels of pesticides and metals were detected in the tank waste, sludge samples, and downgradient sediment samples. All constituents, with the exception of zinc, were detected at levels below background reference values.

Ms. Schaefer stated that a 1000-gallon UST was removed from the Building E5803 site in 2001. In addition to the tank removal, 35 cy of oil-contaminated soil were also removed. The tank was found to contain mostly water, but trace levels of total petroleum hydrocarbons were detected. Sampling completed to further characterize the site included three DPT groundwater and subsurface soil samples, two vertical soil profile samples at four boring locations, and two surface water and sediment samples.

Ms. Schaefer displayed slides depicting the FS groundwater direct push results, and FS media sampling results. Groundwater sampling detected metals, low levels of diesel range organics (DRO), and arsenic above the maximum background reference level. The subsurface soil direct push samples were collected at the 8 to 12-foot interval. Subsurface soil profiles were also collected upgradient of and within the area of the former UST area. Subsurface soil, sediment, and surface water samples collected within the UST area also contained low levels of DRO, explosives, and gasoline range organics.

Ms. Schaefer stated that further evaluation and possible action could be recommended, under the Compliance Program, for the Building E5803 UST Area. Mr. Stachiw added that the oil-contaminated compounds are not CERCLA compounds, and would be covered under the UST program. Mr. Stachiw assured RAB Members that they would be informed of any progress or action taken at the Building E5803 UST Area.

Hog Point Shoreline Stabilization. Mr. Stachiw stated that the shoreline stabilization was discussed at length in the beginning of the meeting. The proposed stabilization is worth considering as part of a remediation at the Hog Point Site. Mr. Stachiw encouraged RAB Members to provide feedback with regard to the shoreline stabilization. Mr. Stachiw stated that he could check with the Directorate of Installation Operations (DIO) to obtain information regarding the priority of protecting shorelines.

Mr. Crabb requested a tour of the Hog Point Shoreline, WRMDF area, WW-90 Fill and Drum Dump, and the HC Grenade Disposal Site. Mr. Stachiw stated that a tour could be arranged and he would coordinate a date with Ms. Powels. Mr. Crabb stated that he would prefer to schedule the tour on 10 September 2004.

Mr. Henry stated that he would like to hold a meeting with Mr. Stachiw and Mr. Paul to discuss surface water and sediment sampling that has been completed in Canal Creek and Reardon Inlet. Mr. Henry stressed the importance of looking at past sampling to ensure that decisions being made and proposed remedial alternatives are appropriate. Mr. Henry would like to make sure that appropriate locations and number of samples have been collected within Canal Creek and Reardon Inlet. Mr. Henry would also like to look at the sampling history of both the east and west banks of Canal Creek in unison, as opposed to being updated on the west bank during the WSA RAB update, and the east bank during the Canal Creek Study Area update. Mr. Stachiw agreed that a meeting could be scheduled, and added that Mr. Paul has much knowledge with regard to the sampling that has been completed in Canal Creek and Reardon Inlet.

Planned Actions/Schedule

Ms. Schaefer displayed a slide detailing the planned actions and schedule for the WSA. The Draft Overall FS Report, the Final Radiological Risk Assessment (RA), and Final Overall RI/FS Report are expected in September 2004. The Draft Overall Proposed Plan and Public Comment Period are expected in September or October 2004. The Draft Overall Record of Decision (ROD) is expected in November 2004, with the Final Overall ROD planned for December 2004.

Mr. Henry asked if the Draft FS Report that is expected to be completed in September 2004 still has to go to regulators for review. Mr. Stachiw explained that the Draft FS Report has not yet been submitted to the regulators for review. Mr. Vavra expressed concern that the presented schedule does not seem realistic. Mr. Stachiw stated that the Draft FS Report will be submitted to the regulators for review upon completion. Mr. Henry speculated that the entire schedule will shift based on completion of the Draft FS and subsequent receipt of regulator comments from regulators.

VII. CLOSING REMARKS

At 9:45 p.m., after confirming that no one present had further questions, Mr. Stachiw adjourned the meeting. The next APG IRP RAB Meeting will be held on Thursday, 30 September 2004 at 7:00 pm in the Edgewood Senior Center. The topic of discussion will be the Aberdeen Area Study Areas.